

What is claimed is:

1. A gain-clamped optical amplifier comprising:

optical reflection means installed on an input optical fiber or an output optical fiber;

optical anti-reflection means installed on the optical fiber opposite to the optical fiber having the optical reflection means installed on; and

an optical amplifier located between the optical reflection means and the optical anti-reflection means, for amplifying an input signal or an output signal,

wherein an amplified spontaneous emission light emitted from the optical amplifier to the input optical fiber and the output optical fiber is reflected by the optical reflection means and amplified in the optical amplifier.

2. The gain-clamped optical amplifier of claim 1, wherein the optical reflection means is one or more optical fiber Bragg gratings installed on the input optical fiber or the output optical fiber.

3. The gain-clamped optical amplifier of claim 1, wherein the optical reflection means is one or more waveguide type Bragg gratings directly engraved on an input optical waveguide or an output optical waveguide of the optical amplifier.

4. The gain-clamped optical amplifier of claim 1, wherein the optical reflection means is comprised of a wavelength division multiplexer and a mirror installed at an end of the wavelength division multiplexer.

5. The gain-clamped optical amplifier of claim 1, wherein the optical anti-reflection means is an isolator.

6. The gain-clamped optical amplifier of claim 1, wherein the optical anti-reflection means uses an optical fiber having a section of the output optical fiber coated for anti-reflection.

7. The gain-clamped optical amplifier of claim 1, wherein the optical anti-reflection means uses an optical fiber having a core section of the output optical fiber cut slantingly.

8. The gain-clamped optical amplifier of claim 1, wherein the optical amplifier is a semiconductor-optical amplifier.

9. The gain-clamped optical amplifier of claim 1, wherein the optical amplifier is an erbium-doped optical fiber amplifier.

10. The gain-clamped optical amplifier of claim 1, wherein the optical amplifier is a rare earth ion doped optical fiber amplifier optically pumped.

11. A gain-clamped optical amplifier comprising:

a first optical fiber Bragg grating installed on an input optical fiber;

a second optical fiber Bragg grating installed on an output optical fiber; and

an optical amplifier located between the first optical fiber Bragg grating and the second optical fiber Bragg grating, for amplifying an input signal,

wherein amplified spontaneous emission lights emitted from the optical amplifier to the input optical fiber and the output optical fiber are respectively reflected from the first optical fiber Bragg grating and the second optical fiber Bragg grating toward the optical amplifier, and the first optical fiber Bragg grating and the second optical fiber Bragg grating respectively have a central wavelength and a reflection bandwidth different from each other.

12. The gain-clamped optical amplifier of claim 11, wherein the first optical fiber Bragg grating and the second optical fiber Bragg grating are respectively one or more installed optical fiber Bragg gratings.

13. The gain-clamped optical amplifier of claim 11, wherein the first optical fiber Bragg grating and the second optical fiber Bragg grating are respectively one or more waveguide type Bragg gratings directly engraved on each of an input optical waveguide and an output optical waveguide of the optical amplifier.

14. The gain-clamped optical amplifier of claim 11, wherein the first optical fiber Bragg grating or the second optical fiber Bragg grating uses an optical fiber having a section thereof coated for anti-reflection.

15. The gain-clamped optical amplifier of claim 11, wherein the first optical fiber Bragg grating and the second optical fiber Bragg grating uses an optical fiber having a core section of the optical fiber cut slantingly.

16. A gain-clamped optical amplifier, comprising:

optical reflection means provided at a side wall of any one of an input side and an output side of an optical amplifier;

optical anti-reflection means provided at an opposite side wall to the side wall having the optical reflection means; and

the optical amplifier disposed between the optical reflection means and the optical anti-reflection means, for amplifying an input optical signal or an output optical signal, wherein the optical reflection means reflects an amplified spontaneous emission light emitted from the optical amplifier to the input and output sides, on the optical amplifier for amplification.

17. The gain-clamped optical amplifier of claim 16, wherein the optical reflection means and the optical anti-reflection means respectively are a wavelength selection reflective mirror and an anti-reflective thin film that are respectively coated on the side walls of the input and output sides of the optical amplifier.